Paediatric Anaesthesia Trainee Research Network, Sub-committee of the APAGBI Scientific Committee (PATRN) (2020). Airway management for dental clearance in a preschool child: A UK survey. *Paediatric Anaesthesia*, *30*(6), 716-719. https://doi.org/10.1111/pan.13882

Received: 11 March 2020 | Revised: 7 April 2020 | Accepted: 8 April 2020

DOI: 10.1111/pan.13882

Pediatric Anesthesia WILEY

SHORT REPORT

Airway management for dental clearance in a preschool child: A UK survey

1 | INTRODUCTION

Dental extractions are one of the most common reasons for pediatric hospital admission (approximately 82 000 children undergo general anesthesia [GA] for dental procedures in the UK).[1] These cases are undertaken in a range of clinical settings from district general hospitals to specialist referral centers and dental hospitals.

Shared airway management presents a challenge to the anesthesiologist and surgeon, balancing good surgical access with provision of a reliable safe airway. High case load creates a pressure to avoid inter-case delay. Current guidelines do not address the choice of airway device, technique for maintenance of anesthesia and the timing or the technique for device removal.[2]

We aimed to take a snapshot of current UK anesthetic technique and airway choice for pediatric dental extractions under GA.

2 | MATERIALS AND METHODS

The Paediatric Anaesthesia Trainee Research Network (PATRN) and The Scientific Committee of the Association of Paediatric Anaesthetists of Great Britain and Ireland (APAGBI) approved a survey of 11 questions relating to a hypothetical clinical scenario (see Appendix 1). This was administered, using SurveyMonkey™, to delegates at the APAGBI Annual Scientific Meeting 2019, and PATRN members and APAGBI linkmen via email.

The responses were analyzed using SPSS (Version 25.0). Ethical approval was not required.

The Scenario:

A 4-year-old boy, with no previous GA exposure, arrives for an elective dental clearance. He is 16 kg, fit and well, has no comorbidities, no allergies, and is starved in line with local policy. He is appropriately anxious but engaged with you during your preoperative assessment. There are no behavioral issues.

3 | RESULTS

There were 233 respondents, with 54% reporting monthly, or more frequent, management of pediatric dental patients. Most respondents were senior clinicians: 73% Consultant Anesthesiologists (of which 78% had specialist pediatric interest), 6% non-Consultants who had completed training, and 18% senior trainees. 61% of respondents would undertake this case in a specialist pediatric center or dental hospital.

Most commonly, GA would be induced intravenously (70%) followed by insertion of a supraglottic airway device (SAD): flexible laryngeal mask airway (60%), classic laryngeal mask airway (15%), Proseal (0.4%), and Ambu curved (0.4%). An endotracheal tube (ETT) was chosen by 22% (44% cuffed, 38% nasal); 3% chose a nasal mask. Airway device choice was dictated by the surgeon in 56% and by local guidance in 21%.

When using an ETT, 64% of anesthesiologists would use a throat pack, 6% would not, and the remainder would leave it to surgeon choice. When using an SAD, 19% of anesthesiologists would use a throat pack, 58% would not, and again the remainder would leave it to surgeon choice.

Sevoflurane was the commonest maintenance agent (78%), and isoflurane or propofol chosen in 11% each. ETT removal would always be performed in the operating theater (47% deeply anesthetized, 53% awake), whereas 67% would remove an SAD in the postanesthesia care unit (PACU). Fifty-eight per cent reported airway device removal in the lateral position and 6% in head-down position.

Anesthesiologists frequently undertaking pediatric dental anesthesia were more likely to choose an SAD; those not exposed in the last 12 months were more likely to choose an ETT (see Figure 1).

4 | DISCUSSION

For this hypothetical case, most respondents would use an SAD with removal in PACU in the lateral position; however, approximately one fifth opted to intubate the child. Evidence, including one meta-analysis, has suggested SAD use in pediatric patients reduces the risks of both intra- and postoperative complications including coughing, desaturation, laryngospasm, and breath holding.[3,4] SADs also allow a lighter plane of anesthesia and avoidance of neuromuscular blocking drugs, potentially facilitating a higher turnover of cases. However, SADs may provide less protection to the airway from blood and foreign material.

The use of an *anesthetic* throat pack is no longer recommended in adult patients undergoing head and neck surgery due to risk of being retained postoperatively.[5] The use of a *surgical* throat pack should eliminate the risk of inadvertent retention as it is included in the surgical count. We

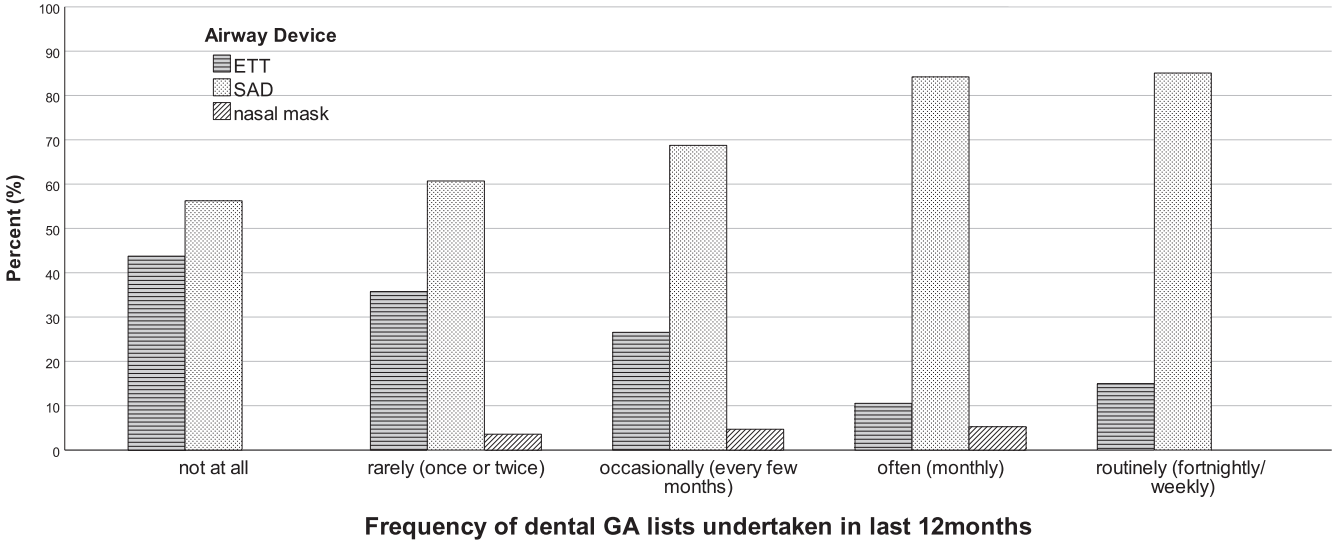

FIGURE 1 Device choice by frequency of pediatric dental list undertaken

believe *surgical* throat pack use reduces blood and saliva pooling above the airway device, lowers the risk of tooth debris contaminating the airway, and decreases trauma to the upper airways from frequent surgical suctioning, although evidence to support this is lacking.

The selection of nasal ETTs was not infrequent, and while they may provide better surgical access, they increase the risk of epistaxis and damage to the nasal turbinates.

5 | CONCLUSIONS

There were significant differences in technique used in our hypothetical scenario; however, most respondents chose to use an SAD. The majority of senior anesthesiologists undertaking pediatric dental cases frequently chose a flexible laryngeal mask airway. SAD use may decrease perioperative complications compared to ETT. Throat pack use was, to our mind surprisingly, low. A large audit, followed by publication of guidance, may standardize and improve care for pediatric dental patients.

ACKNOWLEDGEMENTS

Dr David Mason, Consultant Anaesthetist, Nuffield Dept of Anaesthetics, John Radcliffe Hospital,

Dr Thomas Engelhardt, Associate Professor, Dept of Anesthesia, Montreal Children's Hospital.

CONFLICT OF INTEREST

The authors report no conflict of interest.

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APPENDIX 1

Survey question

A 4-year-old boy, with no previous GA exposure, arrives for an elective dental clearance. He is 16 kg, fit and well, has no comorbidities, no allergies, and is starved in line with local policy. He is appropriately anxious but engaged with you during your preop assessment. There are no behavioral issues.

Questionnaire

1. What would be your first-choice induction technique? (select all that apply)
   - Intravenous
   - Inhalational without nitrous oxide
   - Inhalational with nitrous oxide
   - Sedative premedication
2. What would be your first-choice airway device?
   - Oral uncuffed ETT
   - Oral cuffed ETT
   - Nasal uncuffed ETT
   - Nasal cuffed ETT
   - Classic laryngeal mask airway
   - Flexible laryngeal mask airway
   - Supreme laryngeal mask airway
   - iGel laryngeal mask airway
   - Proseal laryngeal mask airway
   - Nasal mask
   - Other .....
3. Would you routinely use a throat pack?
   - Yes
   - No
   - Dependent on surgeon preference
4. What is the main determinant for your choice of airway (select all that apply)?
   - National guidelines
   - Local policy
   - Surgical operator request
   - Personal preference
   - Other.....
5. What would be your preferred maintenance drugs for this scenario? (select all that apply)
   - Sevoflurane
   - Isoflurane
   - Desflurane
   - Nitrous oxide
   - Propofol
   - Remifentanil
   - Alfentanil
   - Other.....
6. How would you aim to remove the airway device at the end of the case? (select all that apply)
   - Extubate "deep" in theater
   - Extubate awake in theater
   - Supraglottic airway (SAD) device removal "deep" in theater
   - SAD device removal in recovery
   - Change ETT to SAD prior to wake up
   - Recovery with nasal airway in situ
   - N/A
   - Other.....
7. How would you position the patient for device removal? (select all that apply)
   - Supine
   - Lateral
   - Head up
   - Head down
   - Other (please specify)
8. How often have you undertaken a pediatric dental GA list in the last 12 months? (select one)
   - Not at all
   - Rarely (once or twice)
   - Occasionally (every few months)
   - Often (monthly)
   - Routinely (fortnightly/weekly)
9. In what type of clinical environment do you predominantly work? (select all that apply)
   - District General Hospital
   - University Teaching Hospital without Specialist Paediatric Tertiary Centre
   - University Teaching Hospital WITH Specialist Paediatric Tertiary Centre
   - Specialist Children's Hospital
   - Specialist Dental Hospital
   - Other .....
10. What grade are you? (select one)
    - Medical student
    - Foundation Doctor
    - CT1-2
    - ST3-4 anesthetic trainee
    - ST5-7 anesthetic trainee
    - Trust/Staff Grade or Associate specialist
    - Anesthetic Fellow (advanced/Post-CCT)
    - Consultant anesthetist
    - Consultant with an interest in Pediatric Anesthesia
    - Consultant Specialist Paediatric Anaesthetist
    - ODP
    - Other.....

11. Do you feel an educational article with joint input from anesthetists and pediatric oral surgeons would be of interest to your clinical practice? (select one)
    - Yes
    - No
    - Other comments .....